IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : John Peterson	Art Unit : 2624
Patent No. : 7,095,905	Examiner : K. Patel
Issue Date : August 22, 2006	
Serial No. : 09/657,949	
Filed : September 8, 2000	
Title : MERGING IMAGES TO FORM A PANORAMIC IMAGE	

Attn.: Certificate of Corrections Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF REQUEST FOR CERTIFICATE OF CORRECTION

Applicant hereby requests that a certificate of correction be issued for the above patent in accordance with the attached request.

Applicant submitted amendments on January 16, 2004 and February 20, 2004. These amendments were received by the Office on January 20, 2004 and February 24, 2004, respectively. In the Notice of Allowance mailed on March 8, 2004, Examiner Patel informed the Applicant that both of the amendments had been entered. However, upon review of the issued patent, Applicant notes that the amendment filed on February 20, 2004 appears to have been entered in its entirety, but the amendment filed on January 16, 2004 may have been only partially entered. Note that the submission on January 28, 2005 was not an amendment.

As a convenience to the Office, Applicant encloses copies of the amendments originally filed on January 16, 2004 and February 20, 2004. Kindly enter the amendments in the instant patent in their entirety.

In accordance with 37 CFR § 1.322(b), Applicant submits that the nature of the mistake on the part of the Office is such that a certificate of correction is inappropriate in form, and

Applicant : John Peterson   Attorney's Docket No.: 07844-458001 / P422
Patent No. : 7,095,905
Issued   : August 22, 2006
Serial No. : 09/657,949
Filed   : September 8, 2000
Page   : 2 of 2

requests that the Director issue a corrected patent in lieu thereof as a more appropriate form for

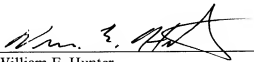correction of the error, without expense to the patentee.

One or more of the errors sought to be corrected were made by applicant, and the

required fee under 37 CFR §1.20(a) in the amount of $100 is being paid concurrently herewith

on the Electronic Filing System (EFS) by way of Deposit Account Authorization.

Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: _Nov. 15, 2007_   _Wm. E. Ht_
                                         William E. Hunter
                                         Reg. No. 47,671

Customer Number 021876
Fish & Richardson P.C.
Telephone: (858) 678-5070
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10677998.doc

Staple
Here
Only

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 1 of 2

PATENT NO.	.: 7,095,905
APPLICATION NO	.: 09/657,949
DATED	.: AUGUST 22, 2006
INVENTOR(S)	.: JOHN W. PETERSON

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

At Column 12, lines 4-19, (claim 1) delete claim 1 and replace with the following:

--1. A method of merging images of segments of a view, comprising:

receiving a first image representing a first segment of the view and a second image representing a second segment of the view;

determining the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator;

blending the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view, wherein the blending comprises:

dividing the second image into a first portion and a second portion based on the position of the second segment relative to the first segment; and

compositing the first portion of the second image on the first image at a relative position of the second segment relative to the first segment to produce the panoramic image, the compositing of the first portion of the second image causing the first portion to mask out a part of the first image.--

MAILING ADDRESS OF SENDER:

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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

Page 2 of 2

PATENT NO.	.:	7,095,905
APPLICATION NO	.:	09/657,949
DATED	.:	AUGUST 22, 2006
INVENTOR(S)	.:	JOHN W. PETERSON

It is certified that an error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

At Column 14, lines 1-18, (claim 15) delete claim 15 and replace with the following:
--15. An article comprising a computer-readable medium on which are tangibly stored computer-executable instructions for merging images of segments of a view, the stored instructions being operable to cause a computer to:

receive a first image representing a first segment of the view and a second image representing a second segment of the view;

determine the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator; and

blend the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view, wherein the instructions to blend comprise instructions to:

divide the second image into a first portion and a second portion based on the position of the second segment relative to the first segment; and

composite the first portion of the second image on the first image at a relative position of the second segment relative to the first segment to produce the panoramic image, causing the first portion to mask out a part of the first image.--

At Column 14, line 61, (claim 20) replace the phrase "the content of third image" with --the content of the third image--.

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Minneapolis, Minnesota 55440-1022

Attorney's Docket No	Certificate of Mailing	Mailing Date	For PTO Use Only
07844-45600!		January 16, 2004	Do Not Mark in This Area
Application No.	Filing Date	Attorney/Secretary Init	
09/657,949	September 8, 2000	RSB/HRT/BJG/!jj	

Title of the Invention
A SERVER FOR MERGING IMAGES TO FORM A PANORAMIC IMAGE

Applicant
John Peterson

Client Reference No.
P422

Enclosures
·Transmittal Letter (1 pages)
·Amendment/Response (12 pages)
·Drawings (informal, 1 sheets)
·Petition for Extension of Time (1 months)
·Check in the amount of $110.00
·Other: Return Receipt Postcard

JAN 2 0 2004

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FISH & RICHARDSON P.C.

PTO/SB/21 (6-98)
Approved for use through 09/30/2000. OMB 0651-0031
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/657,949
Filing Date	September 8, 2000
First Named Inventor	John Peterson
Group Art Unit	2625
Examiner Name	K. Patel
Attorney Docket Number	07844-458001

Total Number of Pages in this Submission
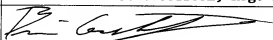
ENCLOSURES *(check all that apply)*

- [ ] Fee Transmittal Form
  - [ ] Fee Attached
- [x] Amendment / Response
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [x] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts uner 37 CFR 1.52 or 1.53

- [ ] Assigment Papers *(for an Application)*
- [x] Drawings
- [ ] Licensing-related Papers
- [ ] Petition Routing Slip (PTO/SB/69) and accompanying Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Small Entity Statement
- [ ] Request for Refund

Remarks

- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and interferences
- [ ] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [x] Additional Enclosure(s) *(please identify below):*

Check # 156181 ($110.00)
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SIGNATURE OF APPLICANT, ATTORNEY OR AGENT

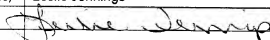|	
Firm or Individual name	Brian J. Gustafson, Reg. No. 52,978
Signature	*[signature]*
Date	January 16, 2004

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to **Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450** on this date: January 16, 2004

Name (Print/Type)	Leslie Jennings		
Signature	*[signature]*	Date	January 16, 2004

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : John Peterson   Art Unit : 2625
Serial No. : 09/657,949   Examiner : K. Patel
Filed   : September 8, 2000
Title   : A SERVER FOR MERGING IMAGES TO FORM A PANORAMIC IMAGE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION FOR ONE-MONTH EXTENSION OF TIME

Pursuant to 37 CFR §1.136, applicant hereby petitions that the period for response to the action dated October 1, 2003, be extended for one month to and including February 1, 2004.

Enclosed is a check for $110 for the required fee. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: _01/16/04_
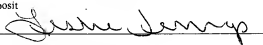
Brian J. Gustafson
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50194810.doc

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: John Peterson	Art Unit	: 2625
Serial No.	: 09/657,949	Examiner	: K. Patel
Filed	: September 8, 2000		
Title	: A SERVER FOR MERGING IMAGES TO FORM A PANORAMIC IMAGE		

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT IN REPLY TO ACTION OF OCTOBER 1, 2003
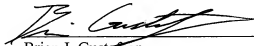
Please amend the above-identified application as follows:

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1.   (Currently Amended) A method of merging images of segments of a view, comprising:

receiving a first image representing a first segment of the view and a second image representing a second segment of the view, ~~the images being received from a remote location over a network~~;

determining the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator;

blending the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view, wherein the blending comprises:

dividing the second image into a first portion and a second portion based on the position of the second segment relative to the first segment; and

compositing the first portion of the second image on the first image at a relative position of the second segment relative to the first segment to produce the panoramic image, the compositing of the first portion of the second image causing the first portion to mask out a part of the first image.~~; and~~

~~transmitting the panoramic image over the network.~~

2.   (Original) The method of claim 1 further comprising:

determining whether the second image overlaps the first image based on the position of the second segment relative to the first segment, wherein the blending the first image and the second image is only performed when the second image overlaps the first image.

3.   (Original) The method of claim 1 further comprising:

        correcting perspective distortion in the second image relative to the first image prior to blending the first image with the second image.

4.   (Canceled)

5.   (Previously Presented) A method of merging a set of images, each image representing a corresponding segment of a view, the set including a first image representing a first segment of the view, a second image representing a second segment of the view, and a third image representing a third segment of the view, where the third segment of the view overlaps both the first segment and the second segment of the view, the method comprising;

        determining a first relative position of the third segment relative to the first segment of the view by processing the content of the third image and the first image;

        determining a first overlap area of the first image and the third image based on the determined first relative position;

        determining a second relative position of the third segment relative to the second segment of the view by processing the content of the third image and the second image;

        determining a second overlap area of the second image and the third image based on the determined second relative position; and

        if the first overlap area is greater than the second overlap area, offsetting the position of the third image relative to the first image and the second image based on the determined first relative position;

        otherwise, offsetting the position of the third image relative to the first image and the second image based on the determined second relative position.

6.   (Original) The method of claim 5 further comprising:

        correcting perspective distortion in at least one of the set of images prior to blending the set of images.

7.   (Previously Presented) The method of claim 5 further comprising:

determining which of the images is a central one and which are peripheral images; and

using the central image as an initial reference image in correcting perspective distortion

in peripheral images.

8.   (Previously Presented) The method of claim 7 further comprising:

determining what pair-wise overlap areas exist between the central image and each of the

peripheral images; and

selecting as the first peripheral image to have perspective distortion corrected a peripheral

image having a maximum pair-wise overlap area with the central image relative to the other

peripheral images.

9.   (Original) The method of claim 8 further comprising:

prior to blending the set of images:

determining a first overlap area between a second one of the peripheral images

and the central one of the images;

determining a second overlap area between the second one of the peripheral

images and the first peripheral one of the images;

if the first overlap area is greater than the second overlap area, correcting

perspective distortion in the second one of the peripheral images relative to the central one of the

images.

10.   (Original) The method of claim 9 further comprising:

prior to blending the set of images:

if the first overlap area is less than the second overlap area, correcting perspective

distortion in the second one of the peripheral images relative to the first peripheral one of the

images.

11.   (Previously Presented) The method of claim 5, further comprising blending the third

image with the first and second image, wherein the blending includes:

dividing the third image into a first portion and a second portion, based on the first relative position; and

compositing the first portion of the third image on the first image at the first position to produce a composite image, the compositing causing the first portion to mask out a part of the first image.

12.   (Previously Presented) The method of claim 11 wherein blending the third image with the first and second image further includes:

dividing the second image into a third portion and a second portion, based on a relative position of the second segment of the view relative to the first segment of the view;

dividing the third portion into a fifth portion and a sixth portion, based on the second relative position; and

compositing the fifth portion of the third image on the composite image based on the second relative position to form the panoramic image, the compositing of the fifth portion causing the fifth portion to mask out a part of the composite image.

13.   (Original) A method of merging images of segments of a view, comprising:

transmitting a first image representing a first segment of the view to a server;

transmitting a second image representing a second segment of the view to the server without providing any information about the position of the second segment relative to the first segment; and

receiving a panoramic image of the view from the server, the panoramic image being a composite of the first image and the second image.

14.   (Currently Amended) The method of claim 13[[14]], wherein the first image is transmitted from a first computer and the second image is transmitted from a second different computer.

15.   (Currently Amended) An article comprising a computer-readable medium on which are tangibly stored computer-executable instructions for merging images of segments of a view, the

stored instructions being operable to cause a computer to:

receive a first image representing a first segment of the view and a second image representing a second segment of the view, ~~the images being received from a remote location over a network~~;

determine the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator; and

blend the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view, wherein the instructions to blend comprise instructions to:

divide the second image into a first portion and a second portion based on the position of the second segment relative to the first segment; and

composite the first portion of the second image on the first image at a relative position of the second segment relative to the first segment to produce the panoramic image, causing the first portion to mask out a part of the first image.~~; and~~

~~transmit the panoramic image over the network.~~

16.   (Currently Amended) The article of claim 15~~16~~ wherein the instructions that determine the position and blend the first and second images operate without positioning information from a human operator.

17.   (Currently Amended) The article of claim 15~~16~~ wherein the stored instructions further comprise instructions operable to cause the computer to:

determine whether the second image overlaps the first image based on the position of the second segment relative to the first segment, wherein blending the first image and the second image is only performed when the second image overlaps the first image.

18.   (Currently Amended) The article of claim 15~~16~~ wherein the stored instructions further comprise instructions operable to cause the computer to:

correct perspective distortion in the second image relative to the first image prior to blending the first image with the second image.

19.   (Canceled)

20.   (Previously Presented) An article comprising a computer-readable medium which stores computer-executable instructions for merging a set of images, each image representing a corresponding segment of a view, the set including a first image representing a first segment of the view, a second image representing a second segment of the view, and a third image representing a third segment of the view, where the third segment of the view overlaps both the first segment and the second segment of the view, the instructions being operable to cause a computer to:

determine a first relative position of the third segment relative to the first segment of the view by processing the content of the third image and the first image;

determine a first overlap area of the first image and the third image based on the determined first relative position;

determine a second relative position of the third segment relative to the second segment of the view by processing the content of third image and the second image;

determine a second overlap area of the second image and third image based on the determined second relative position; and

if the first overlap area is greater than the second overlap area, offset the position of the third image relative to the first image and the second image based on the determined first relative position;

otherwise, offset the third image relative to the first image and the second image based on the determined second relative position.

21. (Currently Amended) The article of claim 20~~21~~ wherein the stored instructions further comprise instructions operable to cause the computer to:

blend the set of images; and

correct perspective distortion in at least one of the set of images prior to blending the set of images.

22. (Previously Presented) The article of claim 21 wherein the stored instructions further comprise instructions operable to cause the computer to:

determine which of the images is a central one and which are peripheral images; and

use the central image as an initial reference image in correcting perspective distortion in peripheral images.

23. (Currently Amended) The article of claim 22~~21~~wherein the stored instructions further comprise instructions operable to cause the computer to:

determine what pair-wise overlap areas exist between the central image and each of the peripheral images; and

select as the first peripheral image to be corrected for perspective distortion a peripheral image having a maximum pair-wise overlap area with the central image relative to the other peripheral images.

24. (Currently Amended) The article of claim 23~~24~~ wherein the stored instructions further comprise instructions operable to cause the computer to:

prior to blending the set of images:

~~determining~~ determine a first overlap area between a second one of the peripheral images and the central one of the images;

~~determining~~ determine a second overlap area between the second one of the peripheral images and the first peripheral one of the images; and

if the first overlap area is greater than the second overlap area, ~~correcting~~ correct perspective distortion in the second one of the peripheral images relative to the central one of the images.

25.   (Currently Amended) The article of claim 24~~25~~ wherein the stored instructions further comprise instructions operable to cause the computer to:

      prior to blending the set of images:

            if the first overlap area is less than the second overlap area, ~~correcting~~ correct perspective distortion in the second one of the peripheral images relative to the first peripheral one of the images.

26.   (Currently Amended) The article of claim 20~~21~~ wherein the stored instructions further comprise instructions operable to cause the computer to blend the third image with the first and second image, wherein the blending includes:

      dividing the third image into a first portion and a second portion, based on the first position; and

      compositing the first portion of the third image on the first image at the first position to produce a composite image[[;]], the compositing causing the first portion to mask out a part of the first image.

27.   (Currently Amended) The article of claim 26~~27~~ wherein blending the third image with the first and second image further includes:

      dividing the second image into a third portion and a second portion, based on a relative position of the second segment of the view relative to the first segment of the view;

      dividing the third portion into a fifth portion and a sixth portion, based on the second relative position; and

      compositing the fifth portion of the third image on the composite image based on the second relative position to form the panoramic image, the compositing of the fifth portion causing the fifth portion to mask out a part of the composite image.

28.   (Currently Amended) The method of claim 1 further comprising:

      prior to blending the set of images:

            determining which of the images is a central one and which are peripheral images; and

using the central image as an initial reference image in correcting perspective distortion in peripheral images.

29.   (Previously Presented) The method of claim 28 further comprising:

determining what pair-wise overlap areas exist between the central image and each of the peripheral images; and

selecting as the first peripheral image to have perspective distortion corrected a peripheral image having a maximum pair-wise overlap area with the central image relative to the other peripheral images.

30.   (New) The method of claim 1 further comprising:

receiving the images from a remote location over a network; and

transmitting the panoramic image over the network.

31.   (New) The article of claim 15 wherein the stored instructions further comprise instructions operable to cause the computer to:

receive the images from a remote location over a network; and

transmit the panoramic image over the network.

<u>Amendments to the Drawings</u>:

     The attached replacement sheet of drawings includes FIG. 3 and replaces the original sheet including FIG. 3. The attached replacement sheet of drawings corrects the line quality of FIG. 3 objected to by the Draftsperson.

Attachments following last page of this Amendment:

     Replacement sheet including FIG. 3 (1 page)

REMARKS

Reconsideration of the action mailed October 1, 2003, is requested in light of the foregoing amendments and the following remarks.

The Examiner rejected claims 1-3 and 15-18 under U.S.C. §102(e) as being anticipated by U.S. Patent 5,986,668 ("Szeliski").

Claims 4 and 19 were objected to as being dependent on rejected base claims but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Examiner has allowed claims 5-14 and 20-29.

Applicant has amended claims 1, 14, 16-18, and 21-28. Applicant has cancelled claims 4 and 19. Claims 1 and 14 have been amended to incorporate the limitations of claims 4 and 19. Claims 16-18 and 21-28 have been amended to correct typographical and formal errors and to provide clearer antecedent basis. New claims 30 and 31 have been added to recite matter deleted from their respective independent base claims. No new matter is added.

Applicant respectfully submits that amended claims 1 and 14 as well as claims 2-3, 15-18, and 30-31, which depend from claims 1 and 14 respectively, are in condition for allowance.

Enclosed is a $110 check for a one-month extension of time. Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: 01/16/04

Brian J. Gustafson
Reg. No. 52,978

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Telephone: (650) 839-5070
Facsimile: (650) 839-5071

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3 / 9

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┌─────────────────────────────────────┐
│  RECEIVE IMAGES OVER NETWORK        │──── 200
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│ DETERMINE POSITION OF SEGMENT CORRESPOND-│
│ ING TO EACH IMAGE RELATIVE TO POSITION OF│──── 202
│ SEGMENTS CORRESPONDING TO OTHER IMAGES   │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│  CORRECT PERSPECTIVE DISTORTION     │──── 204
│  IN ALL RELATIVE TO CENTRAL IMAGE   │
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│ SET PIXELS OF ALL IMAGES VISIBLE EVERYWHERE │──── 206
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│   SET CURRENT IMAGE TO FIRST IMAGE  │──── 208
└─────────────────────────────────────┘
                 │
┌─────────────────────────────────────┐
│ SET CURRENT IMAGE TO NEXT AFTER CURRENT │──── 210
│ IMAGE AND REFERENCE IMAGE TO FIRST IMAGE│◄─────┐
└─────────────────────────────────────┘        │
                 │                              │
┌─────────────────────────────────────┐        │
│ DETERMINE OUTLINE OF PANORAMIC IMAGE FORMED BY │──── 212
│ ALIGNING THE CURRENT AND REFERENCE IMAGES      │
│ BASED ON THE RELATIVE POSITION OF THE SEGMENT  │
│ CORRESPONDING TO THE CURRENT IMAGE             │
└─────────────────────────────────────┘        │
                 │                              │
┌─────────────────────────────────────┐        │
│ DETERMINE LINE DIVIDING PANORAMIC OUTLINE (I.E.,│──── 214
│ LONGEST LINE JOINING POINTS WHERE BORDERS OF    │
│ CURRENT IMAGE AND REFERENCE IMAGE INTERSECT)    │
└─────────────────────────────────────┘        │
                 │                              │
┌─────────────────────────────────────┐        │
│   DIVIDE PANORAMIC OUTLINE INTO     │──── 216  │
│   TWO SECTIONS BASED ON LINE        │         │
└─────────────────────────────────────┘         │
                 │                    218   224  │
┌─────────────────────────────────────┐  ┌──────────────┐
│ DETERMINE WHICH OF THE TWO SECTIONS │  │    SET       │
│ HAS LESS OF THE CURRENT IMAGE THAT IS NOT│  │  REFERENCE  │
│ OVERLAPPED BY THE REFERENCE OUTLINE │  │   TO NEXT    │
└─────────────────────────────────────┘  │    IMAGE     │
                 │                        │    AFTER     │
┌─────────────────────────────────────┐  │  REFERENCE   │
│ SET CURRENT IMAGE TO NOT BE         │  │    IMAGE     │
│ INVISIBLE IN THE DETERMINED SECTION │  └──────────────┘
└─────────────────────────────────────┘         ▲
                 │         222    220            │
            ╱────────────────╲  YES              │
         ╱ ANY MORE            ╲─────────────────┘
        ⟨ IMAGES AFTER REFERENCE│
         ╲ IMAGE BUT BEFORE CURRENT╱
            ╲    IMAGE ?     ╱
                 │ NO
┌─────────────────────────────────────┐
│ DETERMINE MASKING VALUE FOR EACH PIXEL│──── 226
│ OF CURRENT IMAGE BASED ON VISIBLE AREA│
│ OF IMAGE AND PROXIMITY TO DIVIDING LINES│
└─────────────────────────────────────┘
                 │          228
            ╱────────────────╲  YES
         ╱  ANY MORE          ╲──────────► (to 224)
        ⟨ IMAGES AFTER CURRENT │
         ╲     IMAGE ?        ╱
                 │ NO
┌─────────────────────────────────────┐
│ OVERLAP IMAGES BASED ON MASKING     │──── 230    ( DONE )
│ VALUES TO CREATE A PANORAMIC IMAGE  │
└─────────────────────────────────────┘
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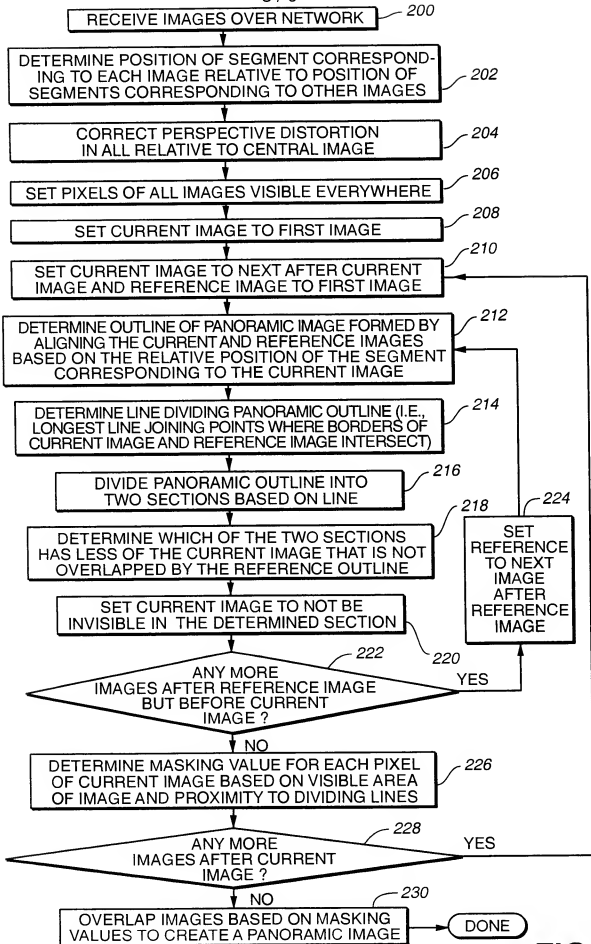
FIG. 3

Attorney's Docket No 07844-458001	Express Mail Label No	Mailing Date February 20. 2004	For PTO Use Only
Application No 09/657.949	Filing Date September 8, 2000	Attorney/Secretary Init BJG/dmb	Do Not Mark in This Area
Title of the Invention A SERVER FOR MERGING IMAGES TO FORM A PANORAMIC IMAGE			
Applicant John Peterson			
Enclosures ·Transmittal Letter (1 page) ·Amendment/Response (11 pages) ·Check in the amount of $180.00 ·Information Disclosure Statement (1 page) ·Form PTO-1449 (1 page) ·Documents listed on the Form PTO-1449 (4 d...			

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : John Peterson   Art Unit : 2625
Serial No. : 09/657,949   Examiner : K. Patel
Filed   : September 8, 2000
Title   : A SERVER FOR MERGING IMAGES TO FORM A PANORAMIC IMAGE

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL LETTER

The following correspondence relating to this application is enclosed:

- Supplemental Amendment In Reply To Action Of October 1, 2003, and Interview Summary (11 pages)
- Check in the amount of $180.00
- Information Disclosure Statement (1 page)
- Form PTO-1449 (1 page)
- Documents listed on the Form PTO-1449 (4 documents)

Please apply any charges not covered, or any credits, to Deposit Account No. 06-1050.

Respectfully submitted,

Date: 20 February, 2004

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	: John Peterson	Art Unit	: 2625
Serial No.	: 09/657,949	Examiner	: K. Patel
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SUPPLEMENTAL AMENDMENT IN REPLY TO ACTION OF OCTOBER 1, 2003, AND INTERVIEW SUMMARY

Please amend the above-identified application as follows:

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) A method of merging images of segments of a view, comprising:

    receiving a first image representing a first segment of the view and a second image representing a second segment of the view;

    determining the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator;

    blending the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view, wherein the blending comprises:

    dividing the second image into a first portion and a second portion based on the position of the second segment relative to the first segment; and

    compositing the first portion of the second image on the first image at a relative position of the second segment relative to the first segment to produce the panoramic image, the compositing of the first portion of the second image causing the first portion to mask out a part of the first image.

2. (Original) The method of claim 1 further comprising:

    determining whether the second image overlaps the first image based on the position of the second segment relative to the first segment, wherein the blending the first image and the second image is only performed when the second image overlaps the first image.

3. (Original) The method of claim 1 further comprising:

correcting perspective distortion in the second image relative to the first image prior to blending the first image with the second image.

4.   (Cancelled)

5.   (Previously Presented) A method of merging a set of images, each image representing a corresponding segment of a view, the set including a first image representing a first segment of the view, a second image representing a second segment of the view, and a third image representing a third segment of the view, where the third segment of the view overlaps both the first segment and the second segment of the view, the method comprising;

determining a first relative position of the third segment relative to the first segment of the view by processing the content of the third image and the first image;

determining a first overlap area of the first image and the third image based on the determined first relative position;

determining a second relative position of the third segment relative to the second segment of the view by processing the content of the third image and the second image;

determining a second overlap area of the second image and the third image based on the determined second relative position; and

if the first overlap area is greater than the second overlap area, offsetting the position of the third image relative to the first image and the second image based on the determined first relative position;

otherwise, offsetting the position of the third image relative to the first image and the second image based on the determined second relative position.

6.   (Original) The method of claim 5 further comprising:

correcting perspective distortion in at least one of the set of images prior to blending the set of images.

7.   (Previously Presented) The method of claim 5 further comprising:

determining which of the images is a central one and which are peripheral images; and

using the central image as an initial reference image in correcting perspective distortion

in peripheral images.

8.   (Previously Presented) The method of claim 7 further comprising:

determining what pair-wise overlap areas exist between the central image and each of the

peripheral images; and

selecting as the first peripheral image to have perspective distortion corrected a peripheral

image having a maximum pair-wise overlap area with the central image relative to the other

peripheral images.

9.   (Original) The method of claim 8 further comprising:

prior to blending the set of images:

determining a first overlap area between a second one of the peripheral images

and the central one of the images;

determining a second overlap area between the second one of the peripheral

images and the first peripheral one of the images;

if the first overlap area is greater than the second overlap area, correcting

perspective distortion in the second one of the peripheral images relative to the central one of the

images.

10.   (Original) The method of claim 9 further comprising:

prior to blending the set of images:

if the first overlap area is less than the second overlap area, correcting perspective

distortion in the second one of the peripheral images relative to the first peripheral one of the

images.

11.   (Previously Presented) The method of claim 5, further comprising blending the third image with the first and second image, wherein the blending includes:

dividing the third image into a first portion and a second portion, based on the first relative position; and

compositing the first portion of the third image on the first image at the first position to produce a composite image, the compositing causing the first portion to mask out a part of the first image.

12.   (Previously Presented) The method of claim 11 wherein blending the third image with the first and second image further includes:

dividing the second image into a third portion and a second portion, based on a relative position of the second segment of the view relative to the first segment of the view;

dividing the third portion into a fifth portion and a sixth portion, based on the second relative position; and

compositing the fifth portion of the third image on the composite image based on the second relative position to form the panoramic image, the compositing of the fifth portion causing the fifth portion to mask out a part of the composite image.

13-14. (Cancelled)

15.   (Previously Presented) An article comprising a computer-readable medium on which are tangibly stored computer-executable instructions for merging images of segments of a view, the stored instructions being operable to cause a computer to:

receive a first image representing a first segment of the view and a second image representing a second segment of the view;

determine the position of the second segment of the view relative to the first segment of the view without the aid of positioning information provided by a human operator; and

blend the first image with the second image based solely on the content of the images and the determined position of the second segment relative to the first segment to merge the first image and the second image into a panoramic image of the view, wherein the instructions to blend comprise instructions to:

divide the second image into a first portion and a second portion based on the position of the second segment relative to the first segment; and

composite the first portion of the second image on the first image at a relative position of the second segment relative to the first segment to produce the panoramic image, causing the first portion to mask out a part of the first image.

16.   (Previously Presented) The article of claim 15 wherein the instructions that determine the position and blend the first and second images operate without positioning information from a human operator.

17.   (Previously Presented) The article of claim 15 wherein the stored instructions further comprise instructions operable to cause the computer to:

determine whether the second image overlaps the first image based on the position of the second segment relative to the first segment, wherein blending the first image and the second image is only performed when the second image overlaps the first image.

18. (Previously Presented) The article of claim 15 wherein the stored instructions further comprise instructions operable to cause the computer to:

correct perspective distortion in the second image relative to the first image prior to blending the first image with the second image.

19. (Cancelled)

20. (Previously Presented) An article comprising a computer-readable medium which stores computer-executable instructions for merging a set of images, each image representing a corresponding segment of a view, the set including a first image representing a first segment of the view, a second image representing a second segment of the view, and a third image representing a third segment of the view, where the third segment of the view overlaps both the first segment and the second segment of the view, the instructions being operable to cause a computer to:

determine a first relative position of the third segment relative to the first segment of the view by processing the content of the third image and the first image;

determine a first overlap area of the first image and the third image based on the determined first relative position;

determine a second relative position of the third segment relative to the second segment of the view by processing the content of third image and the second image;

determine a second overlap area of the second image and third image based on the determined second relative position; and

if the first overlap area is greater than the second overlap area, offset the position of the third image relative to the first image and the second image based on the determined first relative position;

otherwise, offset the third image relative to the first image and the second image based on the determined second relative position.

21.   (Previously Presented) The article of claim 20 wherein the stored instructions further comprise instructions operable to cause the computer to:

      blend the set of images; and

      correct perspective distortion in at least one of the set of images prior to blending the set of images.

22.   (Previously Presented) The article of claim 21 wherein the stored instructions further comprise instructions operable to cause the computer to:

      determine which of the images is a central one and which are peripheral images; and

      use the central image as an initial reference image in correcting perspective distortion in peripheral images.

23.   (Previously Presented) The article of claim 22 wherein the stored instructions further comprise instructions operable to cause the computer to:

      determine what pair-wise overlap areas exist between the central image and each of the peripheral images; and

      select as the first peripheral image to be corrected for perspective distortion a peripheral image having a maximum pair-wise overlap area with the central image relative to the other peripheral images.

24.   (Previously Presented) The article of claim 23 wherein the stored instructions further comprise instructions operable to cause the computer to:

      prior to blending the set of images:

            determine a first overlap area between a second one of the peripheral images and the central one of the images;

            determine a second overlap area between the second one of the peripheral images and the first peripheral one of the images; and

            if the first overlap area is greater than the second overlap area, correct perspective distortion in the second one of the peripheral images relative to the central one of the images.

25.   (Previously Presented) The article of claim 24 wherein the stored instructions further comprise instructions operable to cause the computer to:

prior to blending the set of images:

if the first overlap area is less than the second overlap area, correct perspective distortion in the second one of the peripheral images relative to the first peripheral one of the images.

26.   (Previously Presented) The article of claim 20 wherein the stored instructions further comprise instructions operable to cause the computer to blend the third image with the first and second image, wherein the blending includes:

dividing the third image into a first portion and a second portion, based on the first position; and

compositing the first portion of the third image on the first image at the first position to produce a composite image, the compositing causing the first portion to mask out a part of the first image.

27.   (Previously Presented) The article of claim 26 wherein blending the third image with the first and second image further includes:

dividing the second image into a third portion and a second portion, based on a relative position of the second segment of the view relative to the first segment of the view;

dividing the third portion into a fifth portion and a sixth portion, based on the second relative position; and

compositing the fifth portion of the third image on the composite image based on the second relative position to form the panoramic image, the compositing of the fifth portion causing the fifth portion to mask out a part of the composite image.

28. (Previously Presented) The method of claim 1 further comprising:

prior to blending the set of images:

determining which of the images is a central one and which are peripheral images;
and

using the central image as an initial reference image in correcting perspective
distortion in peripheral images.

29. (Previously Presented) The method of claim 28 further comprising:

determining what pair-wise overlap areas exist between the central image and each of the
peripheral images; and

selecting as the first peripheral image to have perspective distortion corrected a peripheral
image having a maximum pair-wise overlap area with the central image relative to the other
peripheral images.

30. (Previously Presented) The method of claim 1 further comprising:

receiving the images from a remote location over a network; and

transmitting the panoramic image over the network.

31. (Previously Presented) The article of claim 15 wherein the stored instructions further
comprise instructions operable to cause the computer to:

receive the images from a remote location over a network; and

transmit the panoramic image over the network.

<u>REMARKS</u>

Claims 1-3, 5-18, and 20-31 were pending. Claims 13 and 14 have been cancelled.

<u>Interview Summary</u>

Applicant wishes to thank the Examiner for the courtesy of an interview conducted February 18, 2004, following an initial telephone conversation initiated by the Examiner on February 17, 2004. In the interview, in which Applicant's representative Brian J. Gustafson and Examiner Patel participated, the Examiner discussed claims 13-14. Specifically, the Examiner had contacted Applicant's representative to discuss claim 13, which had previously been allowed, and disclosed the existence of additional art (not of record), which on initial review the Examiner believes anticipates claim 13.   The Examiner indicated that the other pending claims were allowable. In order to expedite prosecution, Applicant has cancelled claims 13 and 14. Applicant respectfully submits that claims 1-3, 5-12, 15-18, and 20-31 are in condition for allowance.
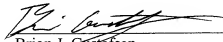

<u>IDS</u>

Applicant is enclosing an IDS (PTO-1449), which includes the art that was disclosed by the Examiner during the interview and two patents referenced by that art.

Please apply any charges or credits to deposit account 06-1050.

Respectfully submitted,

Date: _20 February, 2004_   _____
                                             Brian J. Gustafson
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Art Unit : 2625
Examiner : K. Patel

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Applicant submits the references listed on the attached form PTO-1449.

This statement is being filed after a first Office action on the merits, but before receipt of a final Office action or a Notice of Allowance. A check for $180 in payment of the late submission fee of §1.17(p) is enclosed. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: _20 February, 2004_

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Substitute Form PTO-1449 (Modified)	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 07844-458001	Application No. 09/657,949
Information Disclosure Statement by Applicant (Use several sheets if necessary)		Applicant John Peterson	
(37 CFR §1.98(b))		Filing Date September 8, 2000	Group Art Unit 2625

U.S. Patent Documents

Examiner Initial	Desig. ID	Document Number	Publication Date	Patentee	Class	Subclass	Filing Date If Appropriate
	AA	6,043,837	03/28/00	Driscoll, Jr., et al.			
	AB	6,128,108	10/03/00	Teo			
	AC	6,356,297	03/12/02	Cheng, et al.			
	AD	6,385,349	05/07/02	Teo			
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation Yes	No
	AL							
	AM							
	AN							
	AO							
	AP							

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
	AQ	
	AR	
	AS	
	AT	

Examiner Signature	Date Considered

EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.